

19. A signal receiving apparatus comprising:

a receiver operable to receive a transmitted signal to produce a received signal; and

a demodulator operable to demodulate the received signal to produce a first data stream and a second data stream,

the transmitted signal having information of the first and second data streams, wherein each of the first and second data streams is assigned to a respective constellation in a vector space diagram, and the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream,

the first data stream having data for demodulation including the number of signal points of the constellation for the second data stream,

wherein said demodulator produces the second data stream according to the data for demodulation.

20. A signal transmission system comprising:

a signal transmission apparatus comprising:

a modulator operable to assign each of a first data stream and a second data stream to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream; and

a transmitter operable to transmit the modulated signals; and

a signal receiving apparatus comprising:

a receiver operable to receive a transmitted signal to produce a received signal; and

a demodulator operable to demodulate the received signal to produce the first data stream and the second data stream,

wherein the first data stream has data for demodulation including the number of signal points of the constellation for the second data stream, and

said demodulator produces the second data stream according to the data for demodulation.

21. A signal transmission method comprising:

assigning each of a first data stream and a second data stream to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream; and

transmitting the modulated signals,

wherein the first data stream has data for demodulation including the number of signal points of the constellation for the second data stream.

22. A signal receiving method comprising:

receiving a transmitted signal to produce a received signal; and

demodulating the received signal to produce a first data stream and a second data stream,

the transmitted signal having information of the first and the second data streams, wherein each of the first and second data streams is assigned to a respective constellation in a vector space diagram, and the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream,

the first data stream having data for demodulation including the number of signal points of the constellation for the second data stream,

wherein said demodulating produces the second data stream according to the data for demodulation.

23. A signal transmitting and receiving method comprising:

assigning each of a first data stream and a second data stream to a respective constellation in a vector space diagram to produce modulated signals wherein the number of signal points of the constellation for the first data stream is different from the number of signal points of the constellation for the second data stream;

transmitting the modulated signals;

receiving a transmitted signal to produce a received signal; and

demodulating the received signal to produce the first data stream and the second data stream,  
wherein the first data stream has data for demodulation including the number of signal points  
of the constellation for the second data stream, and  
said demodulating produces the second data stream according to the data for demodulation.